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10/722,929	11/26/2003	Joseph P. Rynd	25226A	1182

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OWENS CORNING
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EXAMINER	
WOLLSCHLAGER, JEFFREY MICHAEL	
ART UNIT	PAPER NUMBER
1791	
MAIL DATE	DELIVERY MODE
11/20/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,929	RYND ET AL.	
	Examiner	Art Unit	
	JEFFREY WOLLSCHLAGER	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10-15 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8, 10-15 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's amendment to the claims filed September 5, 2008 has been entered. Claims 1 and 21 are currently amended. Claims 9, 16-20 and 22-26 have been canceled. Claims 1-8, 10-15 and 21 are pending and under examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 7 and 8 ultimately depend from claim 1. Claim 1 employs "consisting essentially of" language. It is unclear how claims 7 and 8 further limit claim 1. It is unclear what additives may be utilized in view of the "consisting essentially of" language in claim 1. It is also noted that claim 7 reintroduces open "comprising" language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grinshpun et al. (WO 2001/39954) in view of Nelson et al. (US 2005/0027040).

Regarding claim 1, Grinshpun et al. teach a method of manufacturing a rigid foam (Figure 6; page 10, lines 5-30) comprising: incorporating fillers and reinforcing materials such as graphite, conductive carbon black, calcium carbonate, and nanofillers into a polymer (page 17 lines 12-20) and at least one nucleating agent (page 19, line 38 – page 20, line 5), including conventional nucleating agents such as calcium carbonate, incorporating a blowing agent into the melt under a first pressure and a first temperature (page 20, lines 7-30), extruding the polymer melt under a second pressure and temperature to allow the polymer melt to expand and foam, and cooling the foamed product (page 21, lines 9-30) to produce a foam consisting primarily of blends of polystyrene (page 14, line 41-page 15 line 42; page 24), with a cell size ranging from 25 to 7000 micrometers (page 23, lines 11-15). Grinshpun et al. do not explicitly teach that the calcium carbonate employed as a nucleating agent or as a filler/reinforcing material has a particle size in at least one dimension of less than 100 angstroms.

However, Nelson et al. disclose a method wherein inorganic additives such as nanoparticles of calcium carbonate are combined with resin to form nanocomposite additives for extrusion processes, wherein the calcium carbonate employed to form the nanocomposite has a particle size as low as about 2 nm (20 angstroms) (see paragraphs [0038-0043] specifically and

the Abstract and paragraphs [0004, 0008, 0012, 0019, 0020, 0051, 0052, 0056, 0079] for context).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Grinshpun and to have employed the calcium carbonate nanocomposites disclosed Nelson et al., for the purpose, as suggested by Nelson et al., of improving the blendability of the additives and improving the mechanical and thermal properties of the article to be produced.

As to claims 2-4, Grinshpun teaches blends primarily comprising polystyrene (page 14, line 41-page 15 line 42; page 24).

As to claims 5 and 6, Grinshpun teaches various blowing agents may be employed (page 18, lines 6-30).

As to claims 7 and 8, Grinshpun teaches incorporating additives into the polymer melt such as nucleation agents, fillers and pigments (page 17, lines 12-20; page 19, line 38 - page 20, line 30).

As to claims 10-13, Grinshpun discloses employment of polystyrene as the resin and Nelson discloses and suggests intercalating the additive in polystyrene/the resin that the additive is ultimately to be extruded with (paragraphs [0015, 0019, 0020, and 0040-0043]). Grinshpun discloses the nucleating agent can be added within a range of 0.01 to 5 parts by weight per hundred parts by weight of resin (page 19, line 38-page 20 line 5).

As to claims 14 and 15, Grinshpun teaches the foam has a density of 8 to 640 kg/m^3 (page 13, lines 4-22; page 24, lines 25-37) and that the cell size is between 25 and 7000 micrometers (page 23, lines 11-15). Grinshpun is silent as to the other cell structure parameters. However, the combination employs the same claimed materials and the same

claimed process. Accordingly, the same claimed physical properties and effects would intrinsically be achieved by the practice of the combined method.

Claims 1-8, 10-12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grinshpun et al. (WO 2001/39954) in view of Morgenstern (US 6,589,646).

Regarding claim 1, Grinshpun et al. teach a method of manufacturing a rigid foam (Figure 6; page 10, lines 5-30) comprising: incorporating fillers and reinforcing materials such as graphite, conductive carbon black, calcium carbonate, and nanofillers into a polymer (page 17 lines 12-20) and at least one nucleating agent (page 19, line 38 – page 20, line 5), including conventional nucleating agents such as calcium carbonate, incorporating a blowing agent into the melt under a first pressure and a first temperature (page 20, lines 7-30), extruding the polymer melt under a second pressure and temperature to allow the polymer melt to expand and foam, and cooling the foamed product (page 21, lines 9-30) to produce a foam consisting primarily of blends of polystyrene (page 14, line 41-page 15 line 4; page 24), with a cell size ranging from 25 to 7000 micrometers (page 23, lines 11-15). Grinshpun et al. do not explicitly teach that the calcium carbonate employed as a nucleating agent or as a filler/reinforcing material has a particle size in at least one dimension of less than 100 angstroms.

However, Morgenstern discloses that calcium carbonate having a particle size as low as 0.005 um (50 angstroms) may be employed as a nucleating agent in foam applications (Abstract; col. 2, lines 58-67).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Grinshpun and to have employed the calcium carbonate disclosed by Morgenstern for the purpose of employing an art

recognized suitable and conventional nucleating agent to produce a foam product (MPEP 2144.06-2144.07).

As to claims 2-4, Grinshpun teaches blends primarily comprising polystyrene (page 14, line 41-page 15 line 42; page 24).

As to claims 5 and 6, Grinshpun teaches various blowing agents may be employed (page 18, lines 6-30).

As to claims 7 and 8, Grinshpun teaches incorporating additives into the polymer melt such as nucleation agents, fillers and pigments (page 17, lines 12-20; page 19, line 38 - page 20, line 30).

As to claims 10-12, Grinshpun discloses polystyrene and that the nucleating agent can be added within a range of 0.01 to 5 parts by weight per hundred parts by weight of resin (page 19, line 38 – page 20, line 5). Morgenstern discloses employment of from 0.1 to 10% by weight of the nucleating agent (col. 3, lines 1-4).

As to claims 14 and 15, Grinshpun teaches the foam has a density of 8 to 640 kg/m^3 (page 13, lines 4-22; page 24, lines 25-37) and that the cell size is between 25 and 7000 micrometers (page 23, lines 11-15). Grinshpun is silent as to the other cell structure parameters. However, the combination employs the same claimed materials and the same claimed process. Accordingly, the same claimed physical properties and effects would intrinsically be achieved by the practice of the combined method.

Claims 1-8, 10-12, 14, 15 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grinshpun et al. (WO 2001/39954) in view of Chen et al. (WO 2003/055804) and Tan (US 7,160,929).

Note: Citations to Chen et al. are from the US equivalent document US 2004/0234443.

Regarding claims 1 and 21, Grinshpun et al. teach a method of manufacturing a rigid foam (Figure 6; page 10, lines 5-30) comprising: incorporating fillers and reinforcing materials such as graphite, conductive carbon black, calcium carbonate, and nanofillers into a polymer (page 17 lines 12-20) and at least one nucleating agent (page 19, line 38 – page 20, line 5), including conventional nucleating agents such as calcium carbonate, incorporating a blowing agent into the melt under a first pressure and a first temperature (page 20, lines 7-30), extruding the polymer melt under a second pressure and temperature to allow the polymer melt to expand and foam, and cooling the foamed product (page 21, lines 9-30) to produce a foam consisting primarily of blends of polystyrene (page 14, line 41-page 15 line 4; page 24), with a cell size ranging from 25 to 7000 micrometers (page 23, lines 11-15). Grinshpun do not disclose utilizing calcium carbonate having a particle size in at least one dimension of less than 100 angstroms (claim 1) or acicular calcium carbonate (claim 21) with a particle size in at least one dimension of less than 100 angstroms.

However, Chen et al. disclose employment of calcium carbonate needles having a particle size as low as 10 nm (100 angstroms) and fibers having a particle size as low as 1 nm (10 angstroms) that are suitable for strengthening the mechanical properties of plastic materials (Abstract; paragraphs [0003;0049]). Additionally, Tan discloses employment of nanofibers and nanopowders, such as calcium carbonate, in the production of nanocomposite foams (Abstract; col. 1, lines 18-64; col. 3, lines 1-21; col. 3, lines 64-67; col. 4, lines 63-col. 5, lines 17; col. 8, lines 25-34).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have employed calcium carbonate having a particle size of less than 100 angstroms in the method of Grinshpun, including acicular calcium carbonate, as suggested by Chen et al. and Tan, for the purpose, as suggested by Tan of producing a

lightweight material having superior mechanical properties (col. 3, lines 15-20). Further, regarding the exact particle size of the calcium carbonate needles of Chen et al., the examiner submits that at the upper end of the range "less than 100 angstroms" one skilled in the art would have expected the calcium carbonate needles to have had the same properties as at the lower end of the range disclosed by Chen et al. (i.e. 100 angstroms). See MPEP 2144.05 I.

As to the claimed cell orientation of claim 21, the examiner submits the combination suggests employing the same claimed process steps and substantially the same claimed materials. As such, the examiner submits the same claimed effects and physical properties would be achieved by the practice of the combined method.

As to claims 2-4, Grinshpun teaches blends primarily comprising polystyrene (page 14, line 41-page 15 line 42; page 24).

As to claims 5 and 6, Grinshpun teaches various blowing agents may be employed (page 18, lines 6-30).

As to claims 7 and 8, Grinshpun teaches incorporating additives into the polymer melt such as nucleation agents, fillers and pigments (page 17, lines 12-20; page 19, line 38 - page 20, line 30).

As to claims 10-12, Grinshpun employ polystyrene as the resin and disclose that the nucleating agent can be added within a range of 0.01 to 5 parts by weight (page 19, line 38-page 20 line 5).

As to claims 14 and 15, Grinshpun teaches the foam has a density of 8 to 640 kg/m^3 (page 13, lines 4-22; page 24, lines 25-37) and that the cell size is between 25 and 7000 micrometers (page 23, lines 11-15). Grinshpun is silent as to the other cell structure parameters. However, the combination employs the same claimed materials and the same

claimed process. Accordingly, the same claimed physical properties and effects would intrinsically be achieved by the practice of the combined method.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (WO 01/40362) in view of Chen et al. (WO 2003/055804) and Tan (US 7,160,929).

Note: Citations to Chen et al. are from the US equivalent document US 2004/0234443.

Regarding claim 21, Miller et al. teach the basic claimed process of producing an extruded rigid foam to produce an insulating panel (page 10, lines 21-24) wherein a blowing agent is incorporated into the polymer melt at a first pressure and temperature (page 6, line 5-31); extruding the polymer melt under a second pressure and temperature to form a foam and intrinsically cooling the foam to form a product with a cell size within the claimed range (page 2, line 19-page 3, line 24; page 9, line 13-page 10, line 25). The preferred polymer melt includes an alkenyl aromatic polymer material, such as polystyrene (page 3, line 25- page 4, line 28). Miller et al. teach the cell orientation is greater than 0.95 (claim 12). Miller et al. further teach that optional additives, including fillers, may be included to obtain desired foam characteristics (page 5, lines 8-15) and employ talc and titanium dioxide as nucleating agents (page 4, line 30-page 5, line 5; page 1, line 28-34), but do not disclose utilizing acicular calcium carbonate with a particle size in at least one dimension of less than 100 angstroms. However, Chen et al. disclose employment of calcium carbonate needles having a particle size as low as 10 nm (100 angstroms) and fibers having a particle size as low as 1 nm that are suitable for strengthening the mechanical properties of plastics (Abstract; paragraphs [0003;0049]). Additionally, Tan discloses employment of nanofibers and nanopowders, such as calcium carbonate, in the production of nanocomposite foams (Abstract; col. 1, lines 18-64; col. 3, lines 1-21; col. 3, lines 64-67; col. 4, lines 63-col. 5, lines 17; col. 8, lines 25-34).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have employed calcium carbonate having a particle size of less than 100 angstroms in the method of Miller, including acicular calcium carbonate, as suggested by Chen et al. and Tan, for the purpose, as suggested by Tan of producing a lightweight material having superior mechanical properties (col. 3, lines 15-20). Further, regarding the exact particle size of the calcium carbonate needles of Chen et al., the examiner submits that at the upper end of the range "less than 100 angstroms" one skilled in the art would have expected the calcium carbonate needles to have had the same properties as at the lower end of the range disclosed by Chen et al. (i.e. 100 angstroms). See MPEP 2144.05 I.

Response to Arguments

Applicant's arguments filed September 5, 2008 have been fully considered. Applicant's arguments, in view of the amendment to the claims, have overcome the rejection of claims 1-8 and 10-15 based upon Miller in view of Nelson and Miller in view of Chen and Tan. Accordingly, the rejections have been withdrawn. Applicant's other arguments have been fully considered, but they are not persuasive.

Applicant argues that Grinshpun does not teach extruding a foam board as claimed since Grinshpun teaches a separate coalescing step. This argument is not persuasive. The examiner submits the strands of Grinshpun are coalesced as part of the expansion that occurs with the extruding step. The examiner submits the coalescing is not an "extra" step excluded from the claim. For example, Grinshpun teaches "Upon extrusion the foamed hollow strands adhere to each other to form a coalesced strand foam product" (Example 2 and page 21, lines 3-8). Grinshpun teaches the coalesced strands may take the form of a "foam sheet" that has a "rectangular structure" and that the foam sheet may have a width of 48-inches and a length of 4

to 16 feet. Further, in discussing the length, Grinshpun refers to the "board" length (page 11, lines 10-40). As such, the examiner submits the coalesced rectangular foam sheet of Grinshpun is a foam board in accord with the plain meaning of the term and that the coalescing occurs as the material "expand[s]" and "form[s]" a board as part of the claimed extruding step. Accordingly, the rejection based upon Grinshpun is maintained. Further, applicant's other arguments regarding Grinshpun (e.g. no motivation to modify Grinshpun) are not persuasive since the examiner submits Grinshpun is not deficient as argued.

Regarding claim 21, applicant argues that Miller teaches the inclusion of titanium dioxide and talc. This argument is not persuasive as claim 21 also recites "at least one nucleating agent". As such, the inclusion of titanium and talc is not excluded. Applicant further argues that Miller teaches the cell orientation is closer to 1.0. This argument is not persuasive. The examiner submits that the rejection is based upon a combination of references. The secondary references provide a teaching to add acicular calcium carbonate to the process of Miller and provide a motivation to do so. As such, the examiner submits that the combination employs the same claimed materials in the same claimed process and in the same claimed manner. Therefore, it implicitly follows that the same claimed effects and physical properties (e.g. cell orientation) would be achieved by the practice of the combined method.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY WOLLSCHLAGER whose telephone number is (571)272-8937. The examiner can normally be reached on Monday - Thursday 6:45 - 4:15, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. W./
Examiner, Art Unit 1791
November 20, 2008

/Monica A Huson/
Primary Examiner, Art Unit 1791